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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/726,794

Applicant(s)

KOBAYASHI, OSAMU

Examiner

KENAN CEHIC

Art Unit

2416

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 January 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4-13, 17-33 and 37-44 is/are pending in the application.
- 4a) Of the above claim(s) 41-44 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-13, 17-33 and 37-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB08)
- Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Newly submitted claims 41-43 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: For claims 41-43, the claims are directed a interface including a multitude of source video layers (application, link, physical, logical, electrical), where the video application layer provides a data stream format, a number of stream attributes and a streams identification number, the logical layer scramble/unscrambles video data, generates link training patterns, the electrical layer proving parallel to serial and vice versa conversion and spread spectrum capable PLLs and connecting the physical layers of a source and display via a unidirectional link where the link rate is independent of the native rate. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 9-25, 28-42 withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Double Patenting

Claim Rejections - 35 USC § 103

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2. Claims 1,2,4-6, 8-13, 17,19-26, 28-33, 37, 39,40, are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims of US 7,177,329 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because of the following:

Instant Application 10726794	US Patent # 7,177,329
Claim 1. A packet based display interface arranged to couple a video source device to a video sink device, comprising: a transmitter unit coupled to the source device arranged to receive a source packet data stream in accordance with a native stream rate; a receiver unit coupled to the sink device; and a linking unit coupling the transmitter unit and the receiver unit arranged to transfer a video data packet stream formed of a number of video data packets based upon the source packet data stream in accordance with a link rate that is independent of the native stream rate between the transmitter unit and the receiver unit comprising: a unidirectional main link arranged to carry the video data packets	Claims 1,2 Claim 1. A transmission efficient packet based display interface arranged to couple a multimedia source device to a multimedia sink device, comprising: a bi-directional auxiliary channel arranged to transfer information between the multimedia source device and the multimedia sink device and vice versa, wherein the information transferred over the auxiliary channel includes a set of packet attributes; and a unidirectional main link arranged to transport multimedia data packets from the multimedia source device to the multimedia sink device each having a multimedia data packet header wherein neither the main link nor the auxiliary channel include separate clock signal lines, and wherein each of the headers is reduced in size over what would otherwise be necessary since the packet attributes are communicated via the auxiliary channel prior to the transmission of the multimedia

<p>from the transmitter unit to the receiver unit and a bi-directional auxiliary channel arranged to transfer information between the transmitter unit and the receiver unit and vice versa wherein the linking unit does not include a clock.</p>	<p>data packets over the main link and not in the packet headers. Claim 2. A transmission efficient packet based display interface as recited in claim 1, further comprising: a transmitter unit coupled to the source device arranged to receive a source packet data stream in accordance with a native stream rate; a receiver unit coupled to the sink device; and wherein the main link has an associated link transmission rate that is independent of the native stream rate.</p>
<p>Claim 2. A packet based display interface as recited in claim 1, wherein the video data packet stream is one of a number of video data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate.</p>	<p>Claim 4. A transmission efficient packet based display interface as recited in claim 3, wherein the multimedia data packet stream is one of a number of multimedia data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate.</p>
<p>Claim 4. A display interface as recited in claim 1, wherein the bi-directional auxiliary channel is formed of a uni-directional back channel configured to carry information from the sink device to the source device and a uni-directional forward channel included as part of the main channel for carrying information from the source device to the sink device in concert with the back channel.</p>	<p>Claim 5. A transmission efficient packet based display interface as recited in claim 4, wherein the bi-directional auxiliary channel is formed of a uni-directional back channel configured to carry information from the sink device to the source device and a uni-directional forward channel for carrying information from the source device to the sink device in concert with the back channel.</p>
<p>Claim 5. A display interface as recited in claim 2, wherein the main link unit further comprises: a number of virtual links each being associated with a particular one of the multi media data packet streams wherein each of said virtual links has an associated virtual link bandwidth and a virtual link rate</p>	<p>Claim 6. A transmission efficient packet based display interface as recited in claim 5, wherein the main link further comprises: a number of virtual links each being associated with a particular one of the multi media data packet streams wherein each of said virtual links has an associated virtual link bandwidth and a virtual link rate</p>
<p>Claim 6. A display interface as recited in claim</p>	<p>Claim 7. A transmission efficient packer</p>

5, wherein a main link bandwidth is at least equal to an aggregate of the virtual link bandwidths.	based display interface as recited in claim 6, wherein a main link bandwidth is at least equal to an aggregate of the virtual link bandwidths.
Claim 8. A display interface as recited in claim 1, further comprising: a hot plug event detector unit arranged to automatically determine when an active sink device is connected to the linking unit.	Claim 8. A transmission efficient packet based display interface as recited in claim 1, further comprising: a hot plug event detector unit arranged to automatically determine when an active sink device is connected to the display interface.
Claim 9. A display interface as recited in claim 2, wherein the information includes display timing information used by the sink device to provide a displayed image based upon the received data stream.	Claim 9. A transmission efficient packet based display interface as recited in claim 1, wherein the information includes display timing information used by the sink device to provide a displayed image based upon the received data stream.
Claim 10. A display interface as recited in claim 1, wherein the information includes sync loss information, dropped packets information and results of training sessions information.	Claim 10. A transmission efficient packet based display interface as recited in claim 1, wherein the information includes sync loss information, dropped packets information and the results of training sessions information
Claim 11. A display interface as recited in claim 2, wherein the video data packet transfer is an isochronous type transfer that includes a video/graphics data stream and a multichannel audio stream and wherein the information transfer is an asynchronous transfer.	Claim 11. A transmission efficient packet based display interface as recited in claim 1, wherein the multimedia data packet transfer is an isochronous type transfer that includes a video/graphics data stream and a multichannel audio stream and wherein the information transfer is an asynchronous transfer.
Claim 12. A display interface as recited in claim 1, wherein the link rate is adjustable in a range of approximately 1.0 Gigabits per second (Gbps) to approximately 2.5 Gbps.	Claim 12. A transmission efficient packet based display interface as recited in claim 1, wherein the main link rate is adjustable in a range that includes 1.0 Gigabits per second (Gbps) to 2.5 Gbps.
Claim 13. A display interface as recited in claim 1, wherein the receiver unit includes a time-base recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the main link data packets.	Claim 13. A transmission efficient packet based display interface as recited in claim 2, wherein the receiver unit includes a time-base recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the data packets and wherein the time stamp is based upon a determination

	of a number of native stream clocks in 2.sup.20 cycles of link cycle clock frequency period.
Claim 17. A display interface as recited in claim 1 , wherein a native audio stream rate is calculated based upon the audio sample rate, the number of bits per sample and the corresponding link rate.	Claim 16. A transmission efficient packet based display interface as recited in claim 15, wherein a native audio stream rate is calculated based upon the audio sample rate, the number of bits per sample and the corresponding link rate.
Claim 19. A display interface as recited in claim 1, wherein some of the video data packets include a number of sub-packets.	Claim 17. A transmission efficient packet based display interface as recited in claim 1, wherein some of the multimedia data packets include a number of sub-packets each having an associated sub-packet header.
Claim 20. A display interface as recited in claim 19 further comprising: a selective refresh unit included in the sink device that updates only a portion of a displayed graphics image for every video frame based upon a number of image coordinates corresponding to the updated portion of the displayed image by way of sub-packets included in a corresponding video data stream.	Claim 18. A transmission efficient packet based display interface as recited in claim 17 further comprising: a selective refresh unit included in the sink device that updates only a portion of a displayed graphics image for every video frame based upon a number of image coordinates corresponding to the updated portion of the displayed image by way of sub-packets included in a corresponding video data stream.
Claim 21. A packet based method of coupling a video source device to a video sink device, comprising: providing a source device having a transmitter unit coupled thereto; providing sink device having a receiver unit coupled thereto; receiving a source data stream in accordance with a native stream rate by the transmitter unit; coupling the transmitter unit and the receiver unit by way of a linking unit, wherein the linking unit does not include a clock line; forming a video data packet stream formed of a number of video data packets based upon the source data stream; and transferring the video data packet stream in	See Claims 1,2 above.

accordance with a link rate between the transmitter unit and the receiver unit.	
Claim 22. A method as recited in claim 21, wherein the video data packet stream is one of a number of video data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate.	Claim 4. A transmission efficient packet based display interface as recited in claim 3, wherein the multimedia data packet stream is one of a number of multimedia data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate.
Claim 23. providing a unidirectional main link arranged to carry the video data packets from the transmitter unit to the receiver unit; and providing a bi-directional auxiliary channel arranged to transfer information between the transmitter unit and the receiver unit and vice versa.	See claim 1 above.
Claim 24. A method as recited in claim 23, wherein the bi-directional auxiliary channel is formed of a uni-directional back channel configured to carry information from the sink device to the source device and a uni-directional forward channel included as part of the main channel for carrying information from the source device to the sink device in concert with the back channel.	Claim 5. A transmission efficient packet based display interface as recited in claim 4, wherein the bi-directional auxiliary channel is formed of a uni-directional back channel configured to carry information from the sink device to the source device and a uni-directional forward channel for carrying information from the source device to the sink device in concert with the back channel
Claim 25. a number of virtual links each being associated with a particular one of the multi media data packet streams wherein each of said virtual links has an associated virtual link bandwidth and a virtual link rate.	Claim 6. (see above)
Claim 26. wherein a main link bandwidth is at least equal to an aggregate of the virtual link bandwidths.	See Claim 7 above.
Claim 28. A method as recited in claim 22,	See claim 8 above.

wherein the information includes display timing information used by the sink device to provide a displayed image based upon the received data stream	
Claim 29. A method as recited in claim 22, wherein the information includes display timing information used by the sink device to provide a displayed image based upon the received data stream	See claim 9 above.
Claim 30. A method as recited in claim 21, wherein the information includes sync loss information, dropped packets information and the results of training sessions information.	See claim 10 above.
Claim 31. A method as recited in claim 22, wherein the video data packet transfer is an isochronous type transfer that includes a video/graphics data stream and a multichannel audio stream and wherein the information transfer is an asynchronous transfer.	See claim 11 above.
Claim 32. A method as recited in claim 21, wherein the link rate is adjustable in a range of approximately 1.0 Gigabits per second (Gbps) to approximately 2.5 Gbps.	Claim 12 above.
Claim 33. A method as recited in claim 21, wherein the receiver unit includes a timebase recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the main link data packets.	See claim 13 above.
Claim 37. A method as recited in claim 21, wherein a native audio stream rate is calculated based upon the audio sample rate, the number of bits per sample and the corresponding link rate.	See claim 16 above.
Claim 39. A method as recited in claim 21, wherein some of the video data packets	See claim 17 above.

include a number of sub-packets.	
Claim 40. A method as recited in claim 39 further comprising: a selective refresh unit included in the sink device that updates only a portion of a displayed graphics image for every video frame based upon a number of image coordinates corresponding to the updated portion of the displayed image by way of sub-packets included in a corresponding video data stream.	See claim 18 above.

The Instant application has a similar scope of invention as in US patent 7,177,329 B2, but in different wording or format of claims. The common subject matter is a a transmitter unit coupled to the source device arranged to receive a source packet data stream in accordance with a native stream rate; a receiver unit coupled to the sink device; and a linking unit coupling the transmitter unit and the receiver unit arranged to transfer a video data packet stream formed of a number of video data packets based upon the source packet data stream in accordance with a link rate that is independent of the native stream rate between the transmitter unit and the receiver unit comprising: a unidirectional main link arranged to carry the video data packets from the transmitter unit to the receiver unit and a bi-directional auxiliary channel arranged to transfer information between the transmitter unit and the receiver unit and vice versa wherein when the video data stream includes an audio stream and there is no associated time stamp, then the source device informs the video sink device by way of the auxiliary channel of an audio sample rate and a number of bits per sample corresponding to the audio stream.

It has been held that the omission of an element and its function is an obvious expedient if the remaining elements perform the same function as before. In re karlson, 136 USPQ 184 (CCPA).

Also note Ex Parte Raine, 186 USPQ 375 (bd. App. 1969); omission of a reference element whose function is not needed would have been obvious to one skilled in the art.

1. Claim 7, 18, 27, 38 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1,2,13-15 of U.S. Patent No. US 7,177,329 in view of Wolf et al (US 6,914,637 B1).

For claim 7, 18, 27, 38, claims 1,2,13-15 of U.S. Patent No. US 7,177,329 teach the claimed invention as described above.

Furthermore for claim 7 and 27, claims 1,2,13-15 of U.S. Patent No. US 7,177,329 teach, wherein the source data stream is packetized over the respective virtual link (see claim 6).

Patent No. US 7,177,329 does not disclose:

For claim 7 and 27, a mapping definition.

For claim 18 and 38, wherein the number of video data streams are multiplexed to form a single data stream suitable for transmission over the linking unit.

Wolf from the same or similar field of endeavor discloses a display system interface with a mapping features:

For claim 7 and 27, Wolf discloses a mapping definition (see column 21 lines 59-61 "code word.. mapped to source data").

For claim 18 and 38, Wolf discloses wherein the number of video data streams (see Figure 2 "Digvideo" and Figure 8 "Packet 1", "Packet 2..") are multiplexed (see column 29 lines 37-42 "two or more streams.. time-multiplexer") to form a

single data stream (Figure 8 "Packet 1", "Packet 2.. .") suitable for transmission over the linlung unit (see Figure 2, CHO-CHC and column 29 lines 39-41 "multiplexed.. .one...Channel").

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify the system of Patent No. US 7,177,329 by using the features, as taught by Wolf, in order to a mapping features for a source (see column 21 lines 59-61).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 1,2, 9, 18, 19, 21-23, 29, 38, 39,40 rejected under 35 U.S.C. 103(a) as being unpatentable over Ooshima et al (US 2002/0071055) (as evidenced by Zimmerman et al US 6,704,310 and Bruhnke et al US 2003/0174795) in view of Zimmerman et al (US 6,704,310)

For claim 1, Ooshima discloses A packet based see Zimmerman figs 3-4; col 1 line 5-10

“packet-based bust, such as the universal serial bus”; fig 2; col 4 lines 20-28 “USB frames”) display interface arranged to connect (see fig 1; 5a) a

video source source device (see figs 1 and 3; 3) directly to a video display device (see figs 1-3; 2;), comprising:

a transmitter unit (see fig 3; 3, 37) coupled to the video source device (see fig 3; 34, 34a,2) arranged to receive a video

source packet data stream (see section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029-30 “outputs the video signal to the personal computer...mpeg”, section 0036; 0056 “MPEG”) in accordance with a native stream rate (see section 0023 “communication rate”; section 0052 “transfer rate”); a receiver unit (see fig 2; 18)

coupled to the video display device (see figs 1-3; 2;); and a linking unit (see figs 1, 2 and 3; 5a) coupling the transmitter unit (see fig 3; 3, 37) and the receiver unit (see fig 2; 18) arranged to transfer a-video data packet stream formed of a number of video data packets based upon the video source packet data stream (see section 0033-34

“compresses video signals...outputs compressed signals to the display apparatus 2 via the USB controller...and the USB cable”); the native stream rate (see section 0023

“communication rate...12 Mbps”; section 0052) between the transmitter unit (see fig 3; 3, 37) and the receiver unit (see fig 2; 18) comprising: a main link (see figs 1, 2 and 3; 5a) arranged to carry the video data packets (see section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”) from the transmitter unit (see fig 3; 3, 37) to the receiver unit (see fig 2; 18) and a bi-directional channel (see fig 1-3; 5a; section 0023 “USB...transmitting and receiving...bidirectionally) arranged to transfer information between the transmitter unit (see fig 3; 3, 37) and the receiver unit (see fig 2; 18) and vice versa (see section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029 “outputs the video signal to the personal computer...mpeg”, 0056 “MPEG”) wherein the linking unit does not include a clock line (see Bruhnke section 0003 “USB bus contain no...clock line”).

For claim 2, 18, 19, 22, 38, 39, Ooshima discloses the video data packet stream see section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029-30 “outputs the video signal to the personal computer...mpeg”, section 0036; 0056 “MPEG”) in accordance with a native stream rate (see section 0023 “communication rate”; section 0052 “transfer rate”)

For claim 9 and 29, Ooshima discloses the display device see figs 1-3; 2;) to provide a displayed image based upon the received data stream see section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US

controller...and the USB cable”; section 0029 “outputs the video signal to the personal computer...mpeg”, 0056 “MPEG”).

For claim 21, Ooshima discloses A packet based (see Zimmerman figs 3-4; col 1 line 5-10 “packet-based bust, such as the universal serial bus”; fig 2; col 4 lines 20-28 “USB frames”) method of coupling a video source device (see figs 1 and 3; 3) to a video display device (see figs 1-3; 2;), comprising:

providing a video source device (see fig 3; 34, 34a,2) having a transmitter unit (see fig 3; 3, 37) coupled thereto (see section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the USB controller...and the USB cable”); providing video display device (see figs 1-3; 2;) having a receiver unit (see fig 2; 18, 14) coupled thereto;

receiving a video data stream (see section 0032-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029 “outputs the video signal to the personal computer...mpeg”, 0056 “MPEG”) in accordance with a native stream rate (see section 0023 “communication rate”; section 0052 “transfer rate”) by the transmitter unit (see fig 3; 3, 37);

connecting the transmitter unit (see fig 3; 3, 37) and the receiver unit (see fig 2; 18) by way of a linking unit wherein the linking unit (see figs 1-3; 5a) does not include a clock line (see Bruhnke section 0003 “USB bus contain no...clock line”) ;

forming a video data packet stream formed of a number of video data packets based upon the video data stream (see section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB

cable”; section 0029-30 “outputs the video signal to the personal computer...mpeg”; section 0036 0056 “MPEG”); and transferring the video data packet stream (see section 0032-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029 “outputs the video signal to the personal computer...mpeg”, 0056 “MPEG”) between the transmitter unit (see fig 3; 3, 37) and the receiver unit (see fig 2; 18, 14) .

For claim 23, Zimmerman discloses providing a main link arranged to carry the video data packets (see section 0032-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029 “outputs the video signal to the personal computer...mpeg”, 0056 “MPEG”) from the transmitter unit (see fig 3; 3, 37) to the receiver unit (see fig 2; 18, 14).

Ooshima is silent:

For claim 1, a link rate that is independent of the native stream rate ; a unidirectional link and auxiliary channel.

For claim 2 and similarly 22, wherein the data packet stream is one of a number of data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate.

For claim 9 and similarly 29, wherein the information includes display timing information used by the device

For claim 18 and similarly 38, wherein the number of data streams are multiplexed to form a single data stream suitable for transmission over the linking unit.

For claim 19 and 39, wherein some of the data packets include a number of sub-packets

For claim 21, a link rate that is independent of the native stream rate.

For claim 23, providing a unidirectional link arranged to carry data packets; and providing a bi-directional auxiliary channel arranged to transfer information between the transmitter unit and the receiver unit and vice versa.

Zimmerman from the same field of endeavor disclose:

For claim 1, Zimmerman a link rate independent of a native stream rate (see col 2 lines 10-40 “isochronous data...dedicated portion...desired rate...different device bit rates...”; col 1 line 50 through col 2 lines 10 “isochronous pipes...bandwidth required...based upon the sampling characteristics... col 4 lines 1-20 “maximum possible rate..upon frame rate, compression rate...this may typically vary”) ; a unidirectional link (see col 1 lines 9-20 “unidirectional and bidirectional pipes...USB devices...many pipes...”; col 2 lines 50-67 “video...multiple pipes....sending image data and control and synchronization information...multiple pipes”; col 4 lines 20-30 “two pipelines, on for data information and another for control information) and auxiliary channel (col 4 lines 20-30 “two pipelines, on for data information and another for control information)

For claim 2, Zimmerman discloses wherein is one of a number of data packet streams each having an associated adjustable data stream link rate that is independent of the native stream rate (see col 2 lines 10-40 “isochronous data...dedicated portion...desired rate...different device bit rates...”; col 1 line 50 through col 2 lines 10 “isochronous

pipes...bandwidth required...based upon the sampling characteristics... col 4 lines 1-20
“maximum possible rate..upon frame rate, compression rate...this may typically vary”).

For claim 9 and similarly 29, Zimmerman discloses wherein the information includes display timing information used by the device (see col 3 lines 5-25 “synchronization data”; col 4 line 30-67 “synchronization information...” ; col 5 lines 1-39
“SYNCHRO...”)

For claim 18 and similarly 38, Zimmerman discloses wherein the number of data streams are multiplexed to form a single data stream suitable for transmission over the linking unit (see fig 2 and col 4 lines 20-28; pipelines multiplexed in time; col 7 lines 40-55
“multiplexing is provided on a single...pipeline”).

For claim 19 and 39, Zimmerman discloses wherein some of the data packets include a number of sub-packets (see fig 2; 70, 72,74; fig 3)

For claim 21, Zimmerman discloses a link rate independent of a native stream rate (see col 2 lines 10-40 “isochronous data..dedicated portion...desired rate...differente device bit rates...”; col 1 line 50 through col 2 lines 10 “isochronous pipes...bandwidth required...based upon the sampling characteristics... col 4 lines 1-20 “maximum possible rate..upon frame rate, compression rate...this may typically vary”);

For claim 23, Zimmerman discloses providing a unidirectional link (see col 1 lines 9-20
“unidirectional and bidirectional pipes...USB devices...many pipes...”; col 2 lines 50-67
“video...multiple pipes....sending image data and control and synchronization information...multiple pipes”; col 4 lines 20-30 “two pipelines, on for data information and another for control information) arranged to carry data packets (see Zimmerman figs

3-4; col 1 line 5-10 “packet-based bus, such as the universal serial bus”; fig 2; col 4 lines 20-28 “USB frames”); and providing a bi-directional auxiliary channel arranged to transfer information (see col 1 lines 9-20 “unidirectional and bidirectional pipes...USB devices...many pipes...”; col 2 lines 50-67 “video...multiple pipes....sending image data and control and synchronization information...multiple pipes”; col 4 lines 20-30 “two pipelines, one for data information and another for control information) between the transmitter unit and the receiver unit and vice versa (see col 1 lines 5-25 “bidirectional...host software..endpoint..device”).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify / combine the features of Ooshima by using the above recited features, as taught by Zimmerman, in order to provide a wide range of channel, where different devices are able to connect to a bus and bandwidth /rate / latency is allocated to them according to need of their application (voice, video) so the quality of service for that application is satisfied (see Zimmerman cols 1-2)

3. Claims 4 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooshima et al (US 2002/0071055) (as evidenced by Zimmerman et al US 6,704,310 and Bruhnke et al US 2003/0174795) and Zimmerman et al (US 6,704,310) as applied above to claim 1/21, further in view of Traversat et al. (US 2007/0097885)

For claim 4 and similarly 24, Ooshima and Zimmerman discloses the claimed invention as described above.

For claim 4 and similarly 24, Zimmerman discloses carry information (see section 0032-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029 “outputs the video signal to the personal computer...mpeg”, 0056 “MPEG”) from the video display device (see fig 3; 2) to the video source device (see fig 3; 3); carrying information (see section 0032-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029 “outputs the video signal to the personal computer...mpeg”, 0056 “MPEG”) from the video source device (see fig 3; 3) to the video display device (see fig 3; 2)

Ooshima and Zimmerman are silent about:

For claim 4 and 24, wherein the bi-directional auxiliary channel is formed of a uni-directional back channel and a uni-directional forward channel included as part of the main channel for in concert with the back channel

Traversat from the same or similar field of endeavor discloses the following features:

For claim 4 and 24, Traversat discloses wherein the bi-directional auxiliary channel is formed of a uni-directional back channel and a uni-directional forward channel included as part of the main channel for in concert with the back channel (see section 0070 “pipe is unidirectional...second pipe connection...provide bi-directional..mechanism”).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of Ooshima and Zimmerman by using the above recited features, as taught by Traversat, in order to provide a bidirectional channel

with two unidirectional channels thus there is no possibility of data collision and thus loss of data.

4. Claims 5-7, 25-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooshima et al (US 2002/0071055) (as evidenced by Zimmerman et al US 6,704,310 and Bruhnke et al US 2003/0174795) and Zimmerman et al (US 6,704,310) as applied above to claim 2/22, further in view of Fuhrman (5,745,837)

For claim 5-7, 25-27, Ooshima and Zimmerman discloses the claimed invention as described above.

Ooshima and Zimmerman are silent about the claim limitations of Claims 5-7, 25-27.

Fuhrman from the same or similar field of endeavor discloses the following features:

For claim 5 and similarly 25, Fuhrman discloses a number of virtual links (see column 38 lines 6-8, each CPE is connected via virtual link) each being associated with a particular one of the video data packet streams (see column 36, lines 13-18 , lines 25-28 ATM transports multimedia content in) wherein each of said virtual links has an associated virtual link bandwidth (see column 3 lines 46-55, the bandwidth for the virtual links, of each CPE, is allocated) and a virtual link rate (see column 56 lines 27-29 the rate of each virtual link is counted, see also column 49 line 60 to column 50 line 7, each CPE can have a varieties of rates and each CPE is connected via a virtual link)

For claim 6 and similarly 26, Fuhrman discloses wherein a main link bandwidth is at least equal to an aggregate of the virtual link bandwidths (see Figure 45A and 45B, reference sign 1150, we can have a case where the total number of CPE connections through virtual links is equal of less to the total available channels)

For claim 7 and similarly 27, Fuhrman discloses wherein the source data stream (see column 36 lines 25-31) is packetized over the respective virtual link based upon a mapping definition (see column 36 lines 25-39, see also Figure 27, "SAR" and note "virtual link information").

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of Ooshima and Zimmerman by using the above recited features, as taught by Fuhrman, in order to provide a method of reserving bandwidth to devices that have high demand applications (video etc) so the quality of service of those applications can be satisfied (see Fuhrman col 2)

5. Claims 8, 10, 13, 28, 30, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooshima et al (US 2002/0071055) (as evidenced by Zimmerman et al US 6,704,310 and Bruhnke et al US 2003/0174795) and Zimmerman et al (US 6,704,310) as applied above to claim 1/21, further in view of Wolf et al. (US 6,914,637 B1)

For claim 8 and 28, Ooshima and Zimmerman discloses the claimed invention as described above.

Ooshima and Zimmerman are silent about:

For claim 8 and 28, a hot plug event detector unit arranged to automatically determine when an active display device is connected to the linking unit

For claim 10 and 30, the information includes sync loss information, dropped packets information, and the results of training session information.

For claim 13 and 33, wherein the receiver unit includes a time-base recovery unit arranged to regenerate a particular data stream's native rate based upon a time stamp embedded within the main link data packets.

Wolf from the same or similar field of endeavor discloses the following features:

For claim 8 and 28, Wolf discloses a a hot plug event detector unit arranged to automatically determine

when an active display device is connected to the linking unit (column 2 lines 36-39).

For claim 10 and 30, Wolf discloses the information includes sync loss (glitches, column 77 lines 47-50)

information, dropped packets information (see col 41 line 50 through col 42 through 25 “drops..drops all odd video frames...repetition...indicates to receiver..discarded”), and the results of training session information (see col 43 line 1-30; col 46 lines 1-50).

For claim 13 and 33, Wolf discloses wherein the receiver unit includes a time-base recovery unit (see column 13 lines 12-16) arranged to regenerate (see column 39 lines 65-67) a particular data stream's native rate based upon a time stamp embedded within the main link data packets (see column 8 lines 44-51 and column 13 lines 12-16).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of Ooshima and Zimmerman by using the above features, as taught by Wolf, in order to provide the teaching of providing / transmitting auxiliary data when the channel is used for its main purpose, thus decreasing inefficient use of bandwidth (see Wolf col 7)

6. Claims 11, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooshima et al (US 2002/0071055) (as evidenced by Zimmerman et al US 6,704,310 and Bruhnke et al US 2003/0174795) and Zimmerman et al (US 6,704,310) as applied above to claim 1/21, further in view of Wolf et al. (US 6,914,637 B1) and Klingman (US 6,219,736)

For claim 11 and 31, Ooshima and Zimmerman disclose all the claimed invention above.

For claim 11 and 31, Zimmerman discloses isochronous type transfer (see col 1 line 45 through col 2 line 40 “isochronous..isochronous data pipes...” for video / graphics (see col 3 line 8-14 “image-related data”) and audio (see col 1 line 45 through col 2 line 40 “voice”)

Ooshima and Zimmerman are silent about:

For claim 11 and 31, multichannel audio; wherein the information transfer is an asynchronous transfer

Wolf from the same or similar field of endeavor discloses the following features:

For claim 11 and 31, Wolf discloses multichannel audio stream (see col 11 lines 47-58 reference, paying particular attention to use of same time base).

Klingman from the same or similar field of endeavor discloses the following features:

For claim 11 and 31, Klingman discloses wherein the information transfer is an asynchronous transfer (see col 17 lines 30-60 “transactions are...asynchronous...SETUP transactions...CONTROL PIPE”)

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of Ooshima and Zimmerman by using the above recited features, as taught by Klingman and Wolf, in order to provide the teaching

of providing / transmitting auxiliary data when the channel is used for its main purpose, thus decreasing inefficient use of bandwidth (see Wolf col 7); in order to provide an inexpensive device to interface peripheral devices, of various different types, such as currently-available microcontrollers, with a host through the USB or other bus devices while taking advantage of the high speed of the bus device (see Klingman col 6)

7. Claims 12 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooshima et al (US 2002/0071055) (as evidenced by Zimmerman et al US 6,704,310 and Bruhnke et al US 2003/0174795) and Zimmerman et al (US 6,704,310) as applied above to claim 1/21, further in view of Yin (US 2008/0175277)

For claim 12 and 32, Ooshima and Zimmerman discloses the claimed invention as described above.

For claim 12 and 32, Zimmerman discloses link rate is adjustable (see col 2 lines 10-40 “isochronous data..dedicated portion...desired rate...different device bit rates...”; col 1 line 50 through col 2 lines 10 “isochronous pipes...bandwidth required...based upon the sampling characteristics... col 4 lines 1-20 “maximum possible rate..upon frame rate, compression rate...this may typically vary”)

Ooshima and Zimmerman are silent about:

For claim 12 and 32, in a range of approximately 1.0 Gigabits per second (Gbps) to approximately 2.5 Gbps.

Yin from the same or similar field of endeavor discloses the following features:

For claim 12 and 32, Yin discloses in a range of approximately 1.0 Gigabits per second (Gbps) to approximately 2.5 Gbps (see section 0010 “bit rate of 2.5...gbps”).

It would have been obvious to one of the ordinary skill in the art at the time of the invention to modify / combine the features of Ooshima and Zimmerman by using the above recited features, as taught by Yin, in order to provide operating speed that can provide the desired performance needed to achieve the bandwidth needed to provide the needed quality of service.

8. Claim 20 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ooshima et al (US 2002/0071055) (as evidenced by Zimmerman et al US 6,704,310 and Bruhnke et al US 2003/0174795) and Zimmerman et al (US 6,704,310) as applied above to claim 19/39 above, in view of Roberts (4,796,203):

For claim 20 and 40, Ooshima and Zimmerman teach all of the claimed invention as described in claim 19, additionally Ooshima and Zimmerman teaches to transmit a displaying image (see Ooshima section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029-30 “outputs the video signal to the personal computer...mpeg”, section 0036; 0056 “MPEG”); of sub-packets (see Zimmerman fig 2; 70, 72,74; fig 3) included in a corresponding video data stream (see Ooshima section 0033-34 “compresses video signals...outputs compressed signals to the display apparatus 2 via the US controller...and the USB cable”; section 0029-30 “outputs the video signal to the personal computer...mpeg”, section 0036; 0056 “MPEG”) Wolf does not teach a refresh

unit that selectively updates portions of images that need to be update. Roberts from the same or similar field of endeavor teaches a selective refresh unit (see Figure 1, "Interface 10") included in the sink device (see figure 1, reference sign 12, "Monitor") that updates only a portion of a displayed graphics image for every video frame (see column 5 lines 50-60, only new image information are used) based upon a number of image coordinates corresponding to the updated portion of the displayed image (see column 5 lines 61-64, only new image information is updated). Thus it would have been obvious for a person of ordinary skill in the art the invention was made to combine the selective refresh interface as taught by Roberts into the video transmission system as taught by Ooshima and Zimmerman. One could have easily implemented the circuit that Roberts presents in Figure 1 into the transmitter device as taught by Ooshima or Zimmerman. One could have added this circuit and especially the refresh memory as the first circuitry into the transmitter, so that it receives the video signal from the source device (MPEG / harddrive of Ooshima). The motivation is if this circuitry is build in, image portions that do not change need not be updated and thus this redundant information does not need to be transmitted over the link. This obviously saves link bandwidth.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KENAN CEHIC whose telephone number is (571)270-3120. The examiner can normally be reached on Monday through Friday 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, KWANG BIN YAO can be reached on (571) 272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kenan Cehic/

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Examiner, Art Unit 2416

/Kwang B. Yao/

Supervisory Patent Examiner, Art Unit 2416